

occupational safety and health standards in private businesses in Connecticut. In those businesses, OSHA standards are enforced by the U.S. Department of Labor, OSHA. In addition to having enforcement responsibilities in the public sector, CONN-OSHA provides on-site consultations to both public and private sector employers. The mission of the Connecticut Consultation Program is to provide timely, courteous and professional service for Connecticut employers to help them recognize and control workplace hazards and prevent work-related injuries, illnesses, and fatalities. The consultants also provide assistance in developing and implementing effective safety and health programs. These consultations are provided at the request of the employer and are free of charge. CONN-OSHA offers comprehensive training and education programs covering all aspects of occupational safety and health. Provided at no charge, these programs are to be used in conjunction with both consultation and enforcement activities. The state-funded Occupational Health Clinics Program is also administered by CONN-OSHA. This program provides grants-in-aid to occupational health clinics and auxiliary occupational health clinics located in Connecticut. The Occupational Safety and Health Statistics Unit publishes information on workplace injuries, illnesses, and fatalities that occur in Connecticut. This unit also collects data for USDOL-OSHA targeting and program evaluation purposes. For more information, access CONN-OSHA website at: <http://www.ctdol.state.ct.us/osh/aboutosh.htm>

#### **1.2.2.4 Governor's Task Force – Interagency Debris Management Task Force (IDMTF)**

Pursuant to Connecticut General Statutes, Section 28-9, the Governor will declare that a state of Civil Preparedness Emergency exists as a result of a catastrophic event. In the event of such a declared disaster, the Governor will activate the state contracts and will authorize the IDMTF members to participate in all preparedness activities, to serve as operational representatives when debris management and monitoring activities are undertaken, and to assign work for the State Debris Management and Monitoring Contractors by developing task orders. The core membership of the IDMTF includes: DESPP/DEMHS, DEEP, DAS, and ConnDOT, and the State debris contractors. CTNG, Northeast Utilities and United Illuminating will provide continuing participation throughout the event. Other agencies/organizations may be requested to participate on the Task Force as necessary (DAS/BPFM, DOL, DESPP/Connecticut State Police (CSP), Department of Motor Vehicles (DMV), Department of Public Health (DPH), FEMA and others).

#### **1.2.3 Local Governments**

Though not mandated, it is recommended by both federal and State emergency response programs that local governments develop a comprehensive Disaster Debris Management Plan as an addendum to their Emergency Management Plan. Additionally, municipalities should have pre-positioned contracts for debris removal and monitoring to be better prepared to manage disaster debris. The Plan should include identification of suitable DMS, availability of equipment, and projection of debris quantities that could be generated.

### **1.3 Plan Maintenance**

The Plan shall be reviewed annually by DEEP, and in conjunction with DESPP/DEMHS. Required updates identified during the annual review or due to significant development in governmental protocol or lessons learned from a recent major storm event should be directed to DEEP's Bureau of Materials Management and Compliance Assurance, Bureau Chief's Office, 79 Elm Street, Hartford, CT 06106. Changes to the Plan will be the responsibility of DEEP and the revised Plan will be made available on the DEEP's and DESPP's websites.

## CHAPTER 2

# DISASTER TYPES and

# DEBRIS MODELING PROJECTIONS

### 2.1 Overview

This Chapter summarizes the types of natural disasters that could potentially occur in the State and the types of waste materials that could be generated from such events and provides debris modeling waste generation projections. While this Plan is applicable to both natural disasters and man-made disasters, the focus of this Plan is debris management resulting from natural disasters.

### 2.2 Natural Disasters

#### 2.2.1 Hurricanes and Tropical Storms

Per the National Weather Service (NWS), New England hurricanes typically accelerate northward up the coast, reaching an average speed of 33 mph forward motion by the time they pass our latitude. As a result, the storm structure becomes skewed in such a way that the following occurs:

- Outer rain bands with tropical storm force gusts can occur way out ahead of the storm center (sometimes 14 hours in advance of the storm), which can cause coastal flooding and shut down coastal roadways.
- Flooding rains typically become focused along and west of the track of the storm, with the east side of the storm typically having only a few showers and perhaps even some sunshine.
- The strongest winds occur to the east of the track of the storm. Consequently, the storm surge (driven mostly by the strong winds) is highest also to the east of the track of the storm.
- There can be a backlash of gusty winds after the storm center passes, but typically all of the rain occurs on the front end of the storm. It is dry after the storm center passes.

*Historical Perspective on Tropical Storms and Hurricanes that have Impacted Connecticut:* The damaging forces of hurricanes and tropical storms include high velocity winds (up to 150 miles per hour or higher in gusts), storm surge, and wave action. DESPP/DEMHS considers a Category 3 hurricane as the most probable, worst-case disaster scenario facing Connecticut. Although Connecticut has not had a major hurricane in more recent years, DESPP/DEMHS and federal agencies such as FEMA are concerned that the danger of a major hurricane impacting the northeast is likely to occur. The 1938 hurricane and the flooding of 1955 that resulted from heavy rainfall associated with the remnants of two hurricanes are recorded as the worst natural disasters to strike Connecticut. Though not as strong as the 1938 hurricane, the hurricanes named Gloria (1985) and Bob (1991) are two of the more potent hurricanes to strike in the last twenty-five years. Hurricane Bob is noted for having caused significant tree damage in Connecticut.

In 2011, the State was impacted by Tropical Storm Irene. This storm was originally forecasted to be a major event and the expected landfall in New England was to be a strong Category 1 or a weak Category 2 hurricane. Through downgraded to a tropical storm, tree damage was extensive throughout the State and there was enough structural damage along the coastline so that all eight

counties received a Presidential disaster declaration. In 2012, the State was impacted by Hurricane Sandy. Seven of the eight counties received a Presidential disaster declaration.

Storm surge results from low pressure in the center of the storm that allows water levels of the ocean to rise and lift, then fall gently. Wave action from wind on top of the surge or lifting is what causes flooding as waves and surge approach the land. The most severe damage frequently occurs in coastal areas. There has been an overall increase in the coastal population of approximately 33 percent between 1950 and 2000 putting more people and structures at risk to a natural disaster. This is especially true for east coastal New Haven County and all of coastal Middlesex County. These are highly developed vulnerable areas subject to a direct strike from hurricanes. However, a significant amount of tree and structural debris may be encountered far inland. The amount of debris generated by such an event would depend on the path, intensity and timing of the storm. The State and municipalities must be ready to effectively deal with a massive debris cleanup effort following a hurricane. The 1938 hurricane produced a storm surge that was 12 to 16 feet above mean sea level and winds clocked at 120 mph. Debris resulting from the storm was estimated at 20 million tons, 15 million tons (equivalent to approximately 45 million cubic yards) of it being woody vegetation, the rest being mostly brick, treated wood, concrete and metal.

Tropical Storm Irene, with a storm surge coinciding with spring high tide caused considerable flooding and structural damage in several coastal towns, most notably, East Haven. Moderate to major coastal flooding was seen with storm surges of 4 to 5 feet in western Long Island Sound during high tide. Additionally, very heavy rainfall continued across most of the state with rainfall totals in western Connecticut exceeding 8 inches in many locations. As a result, river flooding from Irene was moderate to major in western Connecticut and moderate in eastern Connecticut. The Housatonic River was especially vulnerable to major flooding.

During Hurricane Sandy, the reported storm surge at Bridgeport and New London was 10 and 5.5 feet above normal, respectively. Tides were running 10 feet above normal with strong East winds continuing to push more water into Western Long Island Sound.

### **2.2.2 Tornadoes**

Damage from tornadoes is caused by high velocity rotating winds. Many parts of Connecticut have experienced tornadoes, but the most severe tornadoes in recent years struck the Litchfield Hills and parts of Naugatuck River Valley in July of 1989, the Windsor Locks area in the 1990's, and the City of Bridgeport in 2010. The severity of the damage depends on the size of the tornado funnel and the length of time the funnel strikes the ground. Damage is generally confined to a narrow path extending up to half a mile wide and from a hundred yards to several miles long. Tornado debris includes damaged and destroyed structures, vegetative debris, and personal property.

### **2.2.3 Floods**

The damage resulting from flood events is caused by structural inundation of flood waters and high velocity waters. Structural damage is usually limited to the floodway and the floodplain area immediately adjacent to a river. Heavy structural damage may result from high velocity waters in areas of steep slopes or failure of a flood control project, such as a dam or levee. Flood debris consists of sediment deposited on public and private property, personal belongings discarded from damaged homes, and construction materials. Landslides are often associated with flooding and result in debris consisting of soil, gravel, rock, and some construction material.

In March 2010 there were three major rain events that in combination resulted in severe flooding throughout Connecticut. As a result, the three coastal counties of Fairfield, Middlesex, and New London received a Presidential disaster declaration.

#### **2.2.4 Forest Fires**

Debris from forest fires consists of burned out structures, cars and other metal objects, ash, and charred wood waste. Large-scale loss of ground cover may lead to mud slides, resulting in clogged drainage structures and possible damage to homes and bridges.

#### **2.2.5 Earthquakes**

While the least likely of the natural disasters to occur in Connecticut, the State experienced a minor earthquake in 2011. Earthquakes are caused by shock waves and earth movements along fault lines. Secondary damages, such as fires and explosions, may result from the disruption of utility systems. Debris consists of building materials, personal property, and sediment caused by landslides.

#### **2.2.6 Ice and Snowstorms**

Ice storms can generate significant amounts of woody debris from broken tree limbs and branches, utility lines, wires, poles/towers, and building debris from damaged roofs and structures. Damage is more likely to occur when ice accumulation on trees and limbs reaches half of an inch in thickness. Ice storms are actually more difficult to deal with in terms of power restoration because the post-event weather and temperature dictates how fast ice will melt off trees and wires affecting the ability to restore power.

The January and October 2011 Snowstorms caused extensive damage throughout Connecticut. The January snowstorm delivered snowfall totals of 20 to 30 inches. Heavy snow caused the roofs of many buildings to collapse, forcing the evacuation of residents and employees. The storm forced state troopers to close a 50-mile stretch of Interstate 95 in southwest Connecticut due to numerous trucks becoming stuck on the highway in the snow. Six of the eight counties received a Presidential disaster declaration.

The October Snowstorm, though not an ice storm, was an autumn snow storm, that deposited heavy wet snow on wires and trees, still with foliage. This storm took down another 1% to 2% of the State's trees and impacted approximately 800,000 homes without power for over a week. All eight counties received the Presidential declaration for a disaster area. Until a major catastrophic storm event takes down a significant number of trees (>30%), Connecticut's significant tree overgrowth will make it highly vulnerable to ice storms. All eight counties received a Presidential disaster declaration.

Most recently, in February 2013, a massive blizzard hit the Northeast bringing more than 3.0 feet of snow to some areas and leaving thousands of people without power and/or a means to travel. Snow removal, especially in the larger cities, required extra man-power and specialized equipment like airport grade snow blowers, loading equipment and large-scale hauling trucks. Equipment and manpower was secured through both interstate mutual aid and the Connecticut National Guard.

#### **2.2.7 Catastrophic Animal Mortalities**

Catastrophic animal mortalities can result from a natural disaster such as flooding caused by a hurricane or heavy rains, or may be the direct result of disease. A catastrophic storm may cause a farmer to not have access to the animals that can cause additional deaths. Also, flooding can cause animals to wash onto public and private properties. Disposal of animals presents both an environmental and health issue.

#### **2.2.8 Catastrophic Vegetative Waste (from Disease)**

Connecticut has experienced periodic occurrences of major tree diseases leading to widespread tree death. These outbreaks are usually due to a non-native insect or disease arriving in Connecticut and spreading rapidly, and often fatally, throughout the existing tree population. Examples include the chestnut blight, Dutch elm disease, gypsy moth, and the hemlock woolly adelgid. A problem organism is the emerald ash borer for which a ban exists on the movement of clean wood, both freshly cut and older waste wood, into and out of the county. See DEEP's website regarding additional guidance or

[http://www.ct.gov/dep/cwp/view.asp?a=2697&q=464598&depNav\\_GID=1631](http://www.ct.gov/dep/cwp/view.asp?a=2697&q=464598&depNav_GID=1631) for more information. Potential problem organisms include the Asian longhorn beetle and ramorum blight (sometimes called sudden oak death). Tree decline and death from such insect or disease outbreaks tend to occur over a period of months to years in any one locality – the impact of the outbreak does not require the immediate response of a forest fire or a major storm. However, problems resulting from such damage may call for the attention of tree wardens and other public officials to promptly remove dead and hazardous trees that may be a danger to the public.

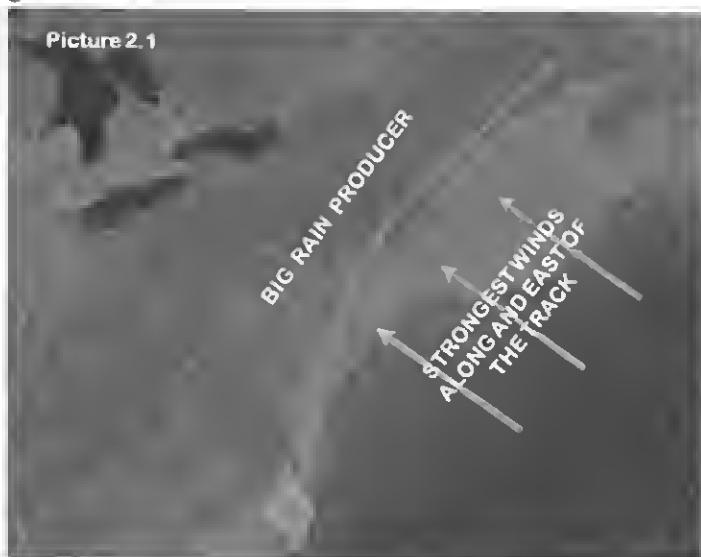
## 2.3 Debris Modeling Projections

For planning purposes, the State has estimated the storm debris generated as the result of a hurricane categories 1, 2, and 3. The assumption used to calculate these estimates is the projected storm path and expected wind speeds per county. Pre-disaster modeling and projections provide volume estimates for preparation of debris management sites and pre-positioning of resources. For each approaching hurricane or other storm event, these projections will be reviewed, analyzed and refined using available modeling formulas and known data. The USACE Hurricane Debris Estimating Model was used to estimate possible debris volumes. The following picture and figure were applied when making assumptions in addressing factors needed in the model's formula. The table illustrates the estimated debris generated per county.

Picture 2.1 shows a historic averaged path of a hurricane along the eastern coast. Wind and precipitation present a critical part in the formula. As the picture illustrates, most of Connecticut should anticipate receiving a "wet" storm. "Wet" storms tend to generate more vegetative debris due to the uprooting of complete trees.

Figure 2.1 shows a map of the State with the projected potential for a category 3 hurricane path based on the historic averaged path of a hurricane along the eastern coast. The map also shows the different wind speeds for a storm of this magnitude: red in category 3 wind speeds, orange indicates category 2 wind speeds, and yellow indicates category 1 wind speeds based on the swath of the storm. This storm path illustration was prepared by the State of Connecticut's debris monitoring contractor, Science Applications International Corporation.

Table 2.1 indicates the total estimated debris generated, per county, for a category 3, category 2, and category 1 hurricane based on the historic averaged path of a hurricane along the eastern coast and wind speeds as shown in Figure 2.1. As the hurricane category decreases, the hurricane category impact decreases by 1 magnitude.



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**Figure 2.1: Wind Speeds by County**



**Table 2.1: Estimated Debris Generation Rate per County showing Households using 2010 Census Data and Under Categories 1, 2, and 3 Hurricane Winds**

County	Households	Category 3 Hurricane		Category 2 Hurricane		Category 1 Hurricane	
		Hurricane Category Impacts	Debris Cu. Yds.	Hurricane Category Impacts	Debris Cu. Yds.	Hurricane Category Impacts	Debris Cu. Yds.
Fairfield	327,670	3	14,619,325	2	4,498,254	1	1,124,563
Hartford	341,717	2	4,691,091	1	1,172,773	Tropical Storm	586,386
Litchfield	74,767	1	252,712	1	252,712	Tropical Storm	126,356
Middlesex	67,078	3	2,947,407	2	906,895	1	226,724
New Haven	322,963	3	14,409,317	2	4,433,636	1	1,108,409
New London	105,052	3	4,687,000	2	1,442,154	1	360,538
Tolland	54,641	2	738,746	1	184,687	Tropical Storm	92,343
Windham	43,870	2	593,122	1	148,281	Tropical Storm	74,140
<b>TOTAL AMOUNT OF DEBRIS:</b>		<b>42,938,721</b>		<b>13,039,391</b>		<b>3,699,461</b>	

The USACE guidelines indicate that hurricane-generated debris would consist of the following: 30% clean, woody debris and 70% mixed construction and demolition debris. Further compositional breakdown of the mixed construction and demolition debris indicates the following: 42% burnable after sorting; 5% soil; 15% metals; and 38% appropriate for disposal at landfills.

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## CHAPTER 3

# ROLES OF GOVERNMENT

## and the

# PRIVATE SECTOR

### 3.1 Overview

In most cases, debris clearance, removal and disposal actions can be accomplished quickly using State and municipal resources augmented by assistance from neighboring municipalities, State agencies and contractor resources. In other cases however, the damage and resulting debris in a municipality is so extensive that it can only be successfully managed through adequate pre-planning and the coordinated efforts of the federal and State government, and local communities. Disaster debris on State property will be the cleanup responsibility of the State. The roles of government and the private sector in managing natural disaster debris are discussed below.

### 3.2 The State Role

#### 3.2.1 State Mission Statement

The shared mission of Connecticut's emergency management community in times of natural disaster is to:

- Maximize the preservation of life and property;
- Correct or alleviate, as expeditiously as possible, serious disaster or emergency-related conditions which present continued threats to the health or welfare of the residents of the State; and
- Facilitate a return to normalcy by all practical means.

In a catastrophic disaster, Connecticut State agencies will be tasked to locate staff, equipment, and funds to devote to emergency debris removal tasks that, in a worst-case scenario, could last many months. Such activities will be reliant upon: debris removal and disposal policies and strategies outlined by this Plan; technical assistance provided by DEEP and implemented under DEEP statutory authorities; and the Governor's emergency powers as necessary. As per the *State's Natural Disaster Plan*, the State EOC Unified Command will coordinate all emergency response during a major natural disaster. If in the event that the State could not effectively manage the debris removal or was overwhelmed by the magnitude of the disaster event, the State could request direct federal assistance through FEMA.

As described in the *State's Natural Disaster Plan*, the following is an outline of operations in the event of a natural disaster:

- The *State's Natural Disaster Plan* is implemented by the order of the Governor.
- Whenever the Governor orders implementation of the *State's Natural Disaster Plan*, the Governor shall activate the State EOC and request representation in the State EOC by appropriate state, federal and private response agencies.
- The State EOC Unified Command will monitor disaster response activities statewide and will coordinate the provision of assistance to State and local authorities as necessary and appropriate.
- The State EOC Unified Command will maintain communication with the FEMA Coordination Center.
- Communication with local authorities will be maintained through the five DESPP/DEMHS Regional Offices.

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- If necessary, the Governor may declare a State of Emergency under CGS Section 28-9 and invoke extensive emergency powers which allow the Governor to take any action reasonably necessary in light of the emergency. The Governor's emergency powers include (but are not limited to) taking operational control of all civil preparedness forces and functions in the State, modifying or suspending statutes and regulations, ordering evacuations, removing debris from public and private land or waters, and seizing property.

The State of Connecticut has in-place both interstate and intrastate mutual aid assistance procedures to manage emergencies and disasters. These authorities and capabilities are described below:

- *Interstate – Emergency Management Assistance Compact:* CGS Chapter 518 Emergency Management Assistance Compact Section 28-23a commits Connecticut to the terms of the Emergency Management Compact (EMAC) which requires member states (called parties) to provide mutual aid assistance to manage emergencies and disasters declared by the Governor of any of the party states. The compact provides a legal framework for requesting and providing assistance. This compact also provides for mutual cooperation in emergency-related exercises, testing or other training activities using equipment and personnel simulating performance of any aspect of the giving and receiving of aid by party states or subdivisions of party states during emergencies. The Commissioner of DESPP/DEMHS is Connecticut's compact representative and is responsible for formulating appropriate interstate mutual aid plans and procedures necessary to implement it.
- *Intrastate – Mutual Aid System:* Public Act 07-56 *An Act Creating an Intrastate Mutual Aid System* commits the State's participating political subdivisions (towns) to the terms of the Intrastate Mutual Aid Compact. The compact provides a legal framework for towns to request and provide mutual aid when any member town declares a local civil preparedness emergency. Any town may withdraw from the compact by enacting a resolution to that effect and submitting a copy of the resolution, within ten days after adopting it, to the Commissioner of DESPP/DEMHS. The Public Act outlines responsibilities of local civil preparedness organizations, procedures for activating the compact, permit and license reciprocity, and reimbursement and liability issues.

The State's Natural Disaster Plan includes procedures regarding dissemination of information to the general public. Direction and control of media liaison activities and public information shall be the responsibility of the Governor's Press Secretary or his designee. To the greatest extent possible, all State agencies will coordinate disaster public information activities with the Governor's Press Secretary to avoid contradictory, confusing, incomplete or erroneous information being given to the public. In addition, DEEP will be preparing public announcements to serve as guidance for the public in their cleanup activities and will be amending a Guidance Document for municipalities regarding debris management pre-event planning. The Guidance Document will be forwarded to each municipality and it will be placed on DEEP's website.

By preparing the State's Disaster Debris Management Plan as an annex to the State's Natural Disaster Plan, establishing State contracts for debris removal operations and monitoring of the debris, and the development of the ConOps Plan, Connecticut has positioned itself to be responsive to meet the emergency needs of the State. At the same time, the Plan and the contracts will expedite enhanced federal assistance to the State in the event of a disaster.

### 3.2.2 Department of Energy and Environmental Protection (DEEP)

Management of disaster debris falls under the existing solid waste management statutes. Implementing recycling and material segregation practices under these statutes, together with statutes related to the management of debris during an emergency situation, is the framework for debris cleanup measures during a disaster event. The relevant CGS includes:

- *CGS Section 22a-208, Powers and duties of the Commissioner* – gives the Commissioner broad powers to plan for and regulate existing or proposed solid waste facilities so that they are operated and closed in such a way as to minimize impacts to the environment and public health, safety and welfare.
- *CGS Section 22a-208a, Permit for construction, alteration or operation of solid waste facility* – gives the Commissioner authority to issue permits for the construction, alteration, and operation of solid waste facilities, including a general permit.
- *CGS Section 22a-6k, Emergency authorization for regulated activity. Temporary authorization for regulated activity and CGS Section 22a-174(f), Powers of the Commissioner. Regulations. Exemptions* – gives the Commissioner authority to authorize actions to address disaster debris management in the event of a disaster declaration or emergency situation.

A summary discussion of emergency authorizations follows:

- *Emergency Authorization:* Under CGS Section 22a-6k (a), the Commissioner may issue an emergency authorization for any regulated activity provided that such activity is necessary to prevent, abate, or mitigate an imminent threat to human health or the environment and that it is not inconsistent with the federal Water Pollution Control Act, the federal Rivers and Harbors Act, the federal Clean Air Act or the federal Resource Conservation and Recovery Act. Such emergency authorization shall be limited to any conditions the Commissioner deems necessary to adequately protect human health and the environment.
- Upon request, DEEP will issue Emergency Authorizations for certain activities related to the management of debris. Emergency authorizations, which will be active for a defined period of time, will be issued to municipalities as well as private entities as needed depending on debris streams and quantities.
- As an example, DEEP has developed a template emergency authorization for solid waste management resulting from a natural disaster event. The template emergency authorization includes conditions that cover the use and management of temporary storage, transfer or processing sites/facilities during and after the emergency; and environmental testing and monitoring protocols.

During and after a catastrophic natural disaster, DEEP will offer information and technical assistance to the municipalities and regional resources recovery authorities in several topical areas including, but not limited to, the following:

- Permitting authorizations covering the collection, processing, recycling, and disposal of debris resulting from the natural disaster incident;
- Contact information for final debris management sites; and
- Contact information for volume reduction, resources recovery, and recycling facilities.

### **3.3 The Municipal Role**

Municipalities will always be the first responders in a disaster situation. Therefore, it is highly advantageous to have a coordinated debris management plan developed in advance of a debris-generating event to expedite the response and recovery process. FEMA encourages and expects local municipalities to do this pre-event preparation and planning. This includes:

- Pre-identifying DMS preferably on municipal property, but contracting to use private property if ideally suited;
- Preparing pre-existing contracts with haulers and demolition contractors for the collection and removal of debris; and
- Pre-planning communication with impacted residents and businesses about cleanup and waste stream segregation and methods of information dissemination.

The criteria for DMS can be found in Chapter 5 of this plan. DEEP will authorize the operation of the DMS under the State solid waste management statutes and regulations to ensure that they are managed in accordance with this *Disaster Debris Management Plan* and in such a way as to protect human health and safety and the environment. Proper management of the sites ensures efficient waste handling and segregation, safety, and accountability to ensure that debris disposal operations are eligible for federal reimbursement.

Municipalities are responsible for the oversight of disaster-related work performed by private contractors working for the municipality. It is strongly recommended that municipalities pre-positioned contracts for debris removal and monitoring. Contracts must exhibit "fair and open competition" where a complete, adequate and realistic specification or purchase description is publicly solicited and multiple responsible bidders are allowed to compete effectively for the business. FEMA requires three qualified bidders. Time and Materials Contracts are discouraged, but may be used when no other contract type is suitable. This contract type must include a ceiling amount and must be limited to work that is necessary during the first 70 hours immediately after a disaster. It can then be followed by a competitively bid unit based contract for cleanup during the remainder of the recovery period. Two types of prohibited contracts include noncompetitive contracts and cost-plus percentage of cost contracts.

Local officials may be required by FEMA or the State Public Assistance Officer (PAO) to explain local procedures for validating contractor invoices for work done. Inadequate monitoring of contractors by local officials could result in loss or reduction of federal and state disaster assistance funds in cases where FEMA or the State PAO determines that contractor invoices are excessively high and that local monitoring of contractors was inadequate to guard against inappropriate billings. Owner/operators of the DMS must contact DEEP prior to closing a site to discuss and coordinate what will be required for closure, including environmental sampling, if needed.

### **3.4 The Federal Role**

There are a number of Federal Agencies that have a role in supporting disaster debris recovery and response and recovery efforts following a Presidential Emergency or Major Disaster Declaration. Among the agencies most directly involved are FEMA, USACOE, NRCS, the USCG, USEPA, and OSHA. See [FEMA Fact sheet 9580.202](#) outlining the federal agencies and their roles and responsibilities.

FEMA is among the most critical federal agency that the State will coordinate emergency response and recovery efforts within a catastrophic event.

## FEMA

When the response and recovery efforts appear to be beyond the capacity of both the municipalities and the State, Connecticut may request federal assistance through FEMA in the form of a Presidential Disaster Declaration. A major disaster declaration in response to a Governor's request specifies, among other things, the type of incident covered, the time periods covered for specific activities, the types of disaster assistance available, and the declared counties.

Following a Presidential disaster declaration, public assistance funds are available to eligible applicants for debris clearance, removal, and disposal operations. Eligible applicants typically include State and local governments, federally recognized Indian Tribes, and certain private nonprofit organizations. Debris located on public property and rights-of-way is eligible.

In order to be eligible for FEMA funding, the debris removal work must:

- be a direct result of a Presidentially declared disaster;
- occur within the designated disaster area; and
- be the responsibility of the applicant at the time of the disaster.

In addition, debris removal work must be necessary to:

- eliminate an immediate threat to lives, public health and safety;
- eliminate immediate threats of significant damage to improved public or private property; or
- ensure the economic recovery of the affected community to the benefit of the community-at-large.

Examples of eligible debris removal activities include:

- debris removal from a public right-of-way to allow the safe passage of emergency vehicles; and
- debris removal from public property to eliminate health and safety hazards.

Examples of ineligible debris removal activities include:

- removal of debris, such as tree limbs and trunks, from an applicant's unimproved property or undeveloped land;
- removal of pre-disaster sediment from engineered channels;
- removal of debris from a natural channel unless the debris poses an immediate threat of flooding to improved property;
- removal of debris from federal lands or facilities that are the authority of another federal agency or department, such as federal-aid roads, USACE navigable waterways, and Natural Resources Conservation Service (NRCS) canals.

Debris removal from private property is generally not eligible for Public Assistance (PA) funding because it is the responsibility of the individual property owner. If property owners move the disaster-related debris to a public right-of-way, the local government may be reimbursed for curbside pickup and disposal for a limited period of time. If the debris on private business and residential property is so widespread that public health, safety, or the economic recovery of the community is threatened, FEMA may fund debris removal from private property, but it must be approved in advance by FEMA. For instance under normal conditions, removal of debris in waterways falls under a number of federal, state and municipal jurisdictions, as well as private property owners.

Under CGS Section 7-146, a municipality can exert its authority to cause the removal from any waterway or tidal water within its jurisdiction of debris wreckage or other similar materials for which a private person or firm or corporation is responsible and which prevents or may tend to prevent the free discharge

of flood waters. However, under CGS Section 28-9c, the governor can authorize state departments or agencies or the use of any of the state's instrumentalities to clear or remove debris from land or water.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act broadly authorizes the President to direct federal agencies to provide *essential assistance* as needed, including cleanup and disposal of waste and debris. FEMA evaluates the request and recommends to the President the type of federal assistance that is warranted. FEMA then implements the National Response Plan (NRP) and issues mission assignments in the form of Emergency Support Functions (ESF). FEMA also opens a Joint Operations Center (JOC) and a Disaster Field Office(s) in the affected area(s) to coordinate efforts with local and State authorities.

FEMA's Debris Mission is as follows: *When directed, remove debris in support of affected States to eliminate threats to lives, public health and safety; eliminate immediate threats of significant damage to improved public or private property; or ensure economic recovery of affected communities to the benefit of the community-at-large.*

ESFs identify critical areas of federal assistance needed to augment state and local response efforts. There are a number of major ESFs that help to facilitate coordinated federal response to a disaster under the National Response Plan. The Public Works and Engineering Emergency Support Function includes debris management and the issuance of debris removal and disposal contracts. The USACE is tasked with managing, monitoring, and providing technical assistance in the clearance, removal, and disposal of debris and the clearing of roads and waterways in the affected areas. The vast majority of debris removal will be conducted by private contractors who are normally responsible for all of the transportation and logistical support required for their operations.

If an emergency or major disaster declaration is made under the authority of the Stafford Act, assistance is usually provided in the form of financial reimbursement of a portion of the disaster-related costs. Debris removal costs incurred by municipalities and Connecticut would be evaluated and if determined eligible would be reimbursed on a cost-sharing basis (normally 75% federal, 25% nonfederal).

In catastrophic disasters, FEMA can also provide direct federal assistance to support the State in performing some of the activities related to debris removal, recycling and disposal. The response capabilities of both the municipalities and Connecticut must be clearly exceeded before this level of assistance can be provided. Since Connecticut municipalities have a solid waste and recycling ordinance by law and the State has mandated recycling (CGS Section 22a-241b), FEMA may also fund recycling of disaster debris especially if the local government can demonstrate that recycling is a cost-effective debris management option.

FEMA may also direct other federal agencies to provide debris removal technical assistance to municipalities and State agencies. Technical assistance may be provided in contract preparation, bid solicitation, contract management, and debris disposal activities. Municipalities and the State agencies remain responsible for all debris removal activities and are reimbursed for their eligible costs. Cost share for federal technical assistance is 100 percent federal.

For more information about Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288) as amended, access the FEMA website at: <http://www.fema.gov/about/stafact.shtm>.

### **3.5 The Private Sector Role**

The private sector will have direct and indirect roles in managing debris resulting from a catastrophic natural disaster. For example, private contractors and waste disposal companies will play a significant role in the debris removal, collection, volume reduction and disposal process for both municipalities and State agencies. In addition, contracting with private commercial entities may be necessary to establish DMS where needed throughout the state. While re-establishment of commercial entities is a private responsibility, access to the facilities of many large retailers may affect overall response and recovery efforts and will be considered when setting priorities for catastrophic response.

State of Connecticut  
Disaster Debris Management Plan, revised June 2013  
Annex to the State Natural Disaster Plan, 2009

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## CHAPTER 4

# CONNECTICUT'S SOLID WASTE MANAGEMENT FRAMEWORK and DEBRIS MANAGEMENT

### 4.1 Overview

Connecticut is a small, densely populated state that has become reforested during the past seventy-five years. Much of the State's population resides in the corridor along the Route 1-95 from the New York border to the New Haven border, and then north along Route 1-91 to the Massachusetts border. Much of this area is low-lying with extensive wetlands and many developed areas are prone to flooding. The 1-95 corridor, which straddles the coastline, would be hardest hit from the damaging forces of a hurricane. Natural disasters precipitate a variety of debris. Disaster debris is a very visible reminder of the scope of a disaster that can account for as much as 40% of all disaster-related costs according to FEMA. The quantity and type of debris generated from any particular disaster is a function of the location and kind of event experienced as well as its magnitude, duration and intensity. The debris, its location, and the size of the area over which it is dispersed, directly impacts the type of collection, recycling, and disposal methods used to address the debris problem, associated costs incurred, and the speed with which the problem can be addressed. This Chapter outlines Connecticut's solid waste management framework and the management and disposal of various types of natural disaster debris and integrates the State's strategy for handling debris through the debris removal and monitoring contracts.

### 4.2 Connecticut's Solid Waste Management Framework

#### 4.2.1 State Solid Waste Management Plan, amended December 2006

Legislatively, Connecticut has formally adopted an integrated waste management hierarchy as a guiding framework for solid waste management efforts. Connecticut's system adheres to this hierarchy by emphasizing source reduction, recycling, composting, and energy recovery from solid waste, while relying on landfill disposal as a last resort. Connecticut's *Solid Waste Management Plan* (SWMP) is based on this hierarchy. The SWMP has as two of its three goals:

- Goal 1: Significantly reduce the amount of Connecticut generated solid waste requiring disposal through increased source reduction, reuse, recycling and composting.
- Goal 2: Manage the solid waste that ultimately must be disposed in an efficient, equitable, and environmentally protective manner, consistent with the statutory solid waste hierarchy.

#### 4.2.2 Connecticut's Solid Waste Management Infrastructure

Connecticut has a comprehensive and highly effective integrated solid waste management system, including widespread municipal solid waste recycling services, regional resources recycling facilities and, for bulky waste, a system of volume reduction facilities and limited capacity for bulky waste landfills.

In 2010, approximately 3.1 million tons of municipal solid waste (MSW) was generated. Of the total, an estimated 24.2 percent was recycled, approximately 68 percent was managed in the State's six resources recovery facilities; 0.67 percent was disposed at in-state landfills; and the remaining 7.5 percent was exported for disposal in other states.

In 2006, approximately 1.4 million tons of Connecticut C&D waste/oversized MSW was reported processed, transferred through or disposed at Connecticut waste facilities. Connecticut's management of C&D debris and oversized MSW relies greatly on out-of-state disposal. This reliance on out of state disposal will challenge Connecticut in managing a significant amount of structural debris resulting from a catastrophic natural disaster. Approximately 86 percent of this C&D total was processed by Volume Reduction Facilities and Transfer Stations and sent to out-of-state disposal sites; 9 percent was disposed at in-state landfills; a very small percent (between 5 and 7 percent) of the material was reported recycled. Analysis of 2010 data seems to indicate a significant drop in tonnage of Connecticut C&D/oversized MSW processed, transferred, or disposed through Connecticut waste facilities (about 60 percent of the amount estimated for 2006). The drop is likely due to the economic downturn and perhaps data reporting and analysis issues. Generation of C&D waste can be affected by a variety of external factors, including economic conditions and the frequency and severity of natural disasters. The C&D figures above do not include the asphalt, brick, and concrete processed by facilities which only process clean fill since these facilities are not permitted by the State, and therefore do not submit tonnage and stumps generated by land clearing activities unless that material was included in the "mixed C&D waste" reported received by Connecticut solid waste facilities. Table 4-1 presents the permitted and registered solid waste facilities in Connecticut.

**Table 4-1.** Type and number of permitted/registered solid waste facilities in Connecticut, January 2013

Type of Solid Waste Facility	Number of Facilities
Transfer Stations (TS)	180
Volume Reduction Plants (VRP)	38
Landfills (Active)	29
○ Municipal Solid Waste (MSW) Landfill	1
○ Bulky Waste Landfill	20
○ Special Waste Landfill	6
○ Bulky Waste Landfill / Special Waste Landfill	1
○ RRF Ash Residue Landfill	1
Resources Recovery Facility (RRF) for MSW	6
RRF for Waste Tires	1
Intermediate Processing Centers	6
Household Hazardous Waste Permanent Facilities	4
Treatment Storage	8
Leaf Compost Facilities	100

Components of Connecticut's solid waste management infrastructure include:

- *Transfer Stations:* There are 180 transfer stations, the majority of which are municipally operated. The transfer stations at the municipal level receive both municipal solid waste (MSW) and oversized MSW (commonly referred to as bulky waste) that can include construction and demolition debris. These facilities then transfer this waste to either in-state or out-of-state landfills or volume reduction facilities. Most transfer stations only aggregate waste and have limited storage capacity.
- *Volume Reduction Plants (VRP):* There are 38 VRPs permitted to process construction and demolition debris and other types of solid waste suitable for sorting/recycling (including clean wood) of which at least 15 are permitted to receive more than 500 tons per day. VRPs are sorting and recycling a portion (10% -20%) of the received waste and subsequently, the remaining solid waste undergoes some form of processing for volume reduction and further disposal at in-state and/or out-of-state permitted landfills.

- Landfills - MSW Landfills, Bulky Waste/Special Waste Landfills: There are 29 active landfills, and consist of the following subsets:
  - MSW - There is only 1 municipal solid waste landfill remaining in the State. The Windsor-Bloomfield Landfill is permitted to take both municipal solid waste and construction and demolition debris. The Manchester Landfill is permitted to take only construction and demolition debris.
  - Bulky Waste (BW) - There are 20 active landfills in Connecticut that accept C&D debris/oversized MSW or C&D waste only; only one of these is privately owned and operated. Most of these landfills serve only their communities.
  - Special Waste (SPC) - There are 6 special waste landfills which may receive such wastes as paper sludge, ash sludge, and aluminum residuals.
  - There is 1 landfill that accepts both bulky waste and special waste
  - RRF Ash Residue - There is 1 landfill permitted to receive ash residue. Putnam Landfill, with an expected closure in the year 2017, is permitted to only accept the ash residue generated from MSW RRFs.
- Resources Recovery Facilities (RRFs) for MSW: Connecticut is highly dependent on RRFs for municipal solid waste disposal. The State has 6 MSW RRFs, having a combined maximum permitted design capacity of approximately 2.6 million tons per year and currently all are operating at full capacity.
- Resources Recovery Facilities for Waste Tires: There is 1 RRF facility in Connecticut (ReEnergy Sterling Resource Recovery Facility) that handles waste tires.
- Intermediate Processing Centers: There are 6 Intermediate Processing Centers that can recycle an item(s), then market and deliver for reuse the end product(s). Such facilities are owned by public or private entities or combinations thereof and may offer service on a State, regional, municipal or sub-municipal level.
- Household Hazardous Waste Permanent Facilities: There are 4 permanent regional household hazardous waste facilities in New Haven, Manchester, Essex and Willington. The Metropolitan District Commission operates a mobile facility in the Hartford region.
- Treatment Storage: There are 8 sites that are permitted for treatment and storage of hazardous waste materials.
- Leaf Compost Facilities: There are 100 sites registered with the State that can process leaves on-site.

Other waste handling operations include the following:

- Aggregate Recycling Facilities: These facilities operate clean fill, concrete, rubble, and asphalt recycling facilities.
- Scrap Metal Processors: The State has several large scrap metal processors that can process metal segregated from construction and demolition.
- Hazardous waste: The private sector handles this material and it is shipped out-of-state for recycling or disposal.
- Biomedical Waste Transporters: DEEP permits biomedical waste transporters.
- Asbestos waste: Asbestos containing material is handled by Connecticut licensed asbestos contractors for removal and disposal.
- Lead waste: Lead containing material is handled by Connecticut licensed lead abatement contractors for removal and disposal.

Connecticut's existing solid waste management policies, programs and infrastructure constrain disaster debris management planning in a number of very significant ways:

- *Open Burning:* CGS Section 22a-174 (f) provides the framework under which open burning can be conducted in the State. This statute enumerates certain activities and conditions where open burning may be authorized.
- *Out-of-State Disposal:* Some of the construction and demolition debris (i.e., clean wood, not treated wood) generated by a disaster may, as a last resort in conjunction with open burning, be able to be incinerated in RRFs based on available capacity at these facilities. The bulk of disaster related debris, especially C&D, will ultimately need to be temporarily stockpiled and then disposed out-of-state because of the limited in-state disposal capacity at VRPs.
- *In-state Land filling.* Because remaining landfill capacity is so scarce in Connecticut, land filling must be reserved for MSW that cannot be incinerated in RRFs and for the disposal of asbestos contaminated debris. Any reopening and use of closed and *capped landfills* for these purposes or for disposal of demolition debris will be subject to a critical review, in consultation with USEPA.
- *Segregation Requirements:* In order to minimize expensive out-of-state shipment of materials that could be handled in-state, proper segregation of debris type at the site of generation and at DMS is essential.
- *Debris Management Site (DMS) Demobilization Priority:* If it is necessary to utilize DMS in coastal locations, which in turn may be subject to repeated storm impacts, these sites will need to be de-mobilized as soon as possible in order to prevent environmental damage from future storms.

### **4.3 Connecticut's Approach to Debris Management**

Connecticut's *Disaster Debris Management Plan* functions within the framework of the *State's Solid Waste Management Plan*. Connecticut will approach managing disaster debris management and capacity as follows:

- Divert as much material from disposal as possible through recycling, composting and other legitimate diversion options. The types of materials that could be diverted from disposal could include: vegetative waste (clean wood from brush and trees); building materials (asphalt, brick and concrete); recyclable metals (i.e., abandoned vehicles, white goods; scrap metals); and household hazardous wastes.
- Utilize volume reduction techniques to improve debris management efficiencies and minimize impacts on landfill capacities;
- Use Connecticut's in-state disposal capacity for disposal of disaster debris as efficiently as possible, recognizing that most construction and demolition debris is transferred out-of-state for disposal; also allow for temporary tonnage increases at permitted in-state solid waste facilities on an emergency basis.
- Rely on permitted Transfer Stations to transfer waste that cannot be diverted from disposal (recycling, composting, other) to waste handling facilities out-of-state for disposal.
- Rely on permitted Volume Reduction Facilities to reduce and transfer waste that cannot be diverted from disposal (i.e., recycling, composting, other) to waste handling facilities out-of-state for disposal.
- Consider alternative technologies for managing portions of the debris waste stream, in-state or out-of-state, such as biomass facilities.
- Use approved DMS for processing debris for recycling and disposal.

## 4.4 Disaster Debris Management Strategies

The *Disaster Debris Management Plan* implemented by Connecticut State agencies and municipalities will be based on recycling and material separation at the point of generation to the extent possible with additional segregation occurring at DMS in order to minimize disposal and reduce potential threats to human health and safety. DMS will be those sites that have been identified by local and State government, and which have been evaluated and approved by DEEP for the purposes of collection, volume reduction, and transfer to final permitted disposal and recycling facilities. DEEP is responsible for the permitting of these sites and will do so through an Emergency Authorization. The goal will be to maximize potential processing and recycling options consistent with the *State Solid Waste Management Plan*. This strategy will be of highest priority and public education together with municipal, State, and federal cooperation will be imperative to effectively carry out this mission. If there is advance warning of the pending event, as there is likely to be with a hurricane, DEEP will participate with DESPP/DEMHS so as to prepare municipal officials and the general public for their roles in debris management. The debris segregation requirements, hazardous waste management procedures, and DMS plans will be reviewed. Access to the selected DMS will be secured. State and municipal equipment that will be needed in the clean-up will be moved to safe locations. Public announcements will be made regarding the potential hazards of moving storm debris, the rationale for and importance of debris segregation requirements, and the location of household hazardous waste aggregation facilities.

### 4.4.1 Management and Disposal of Various Debris Types

The types of materials generated from disasters and requiring management can include:

- clean wood from brush and trees;
- putrescent municipal solid waste;
- construction and demolition debris from damaged structures;
- white goods;
- household hazardous waste from damaged residences;
- hazardous wastes;
- aggregate (asphalt, brick, concrete);
- scrap metal;
- electronic waste;
- soil, silt, and sediment (uncontaminated; contaminated);
- animal mortalities;
- waste tires;
- abandoned vehicles and abandoned boats; and
- utility-related debris.

Volume reduction methods that will be implemented for cleanup operations will include primarily grinding and chipping, and in the most dire situations burning or incineration. Open burning must be authorized by DEEP. Additionally, the techniques for open burning must use FEMA recommended air curtain pit incineration methods or a mobile air curtain burner, or other alternate methods as approved by FEMA and the State. This is the least preferred option, and will only be considered if no other debris management options are available. Recycling will be considered early in the debris clearance, removal and disposal operation because it presents the best opportunity to reduce the overall costs of cleanup. Metals, green waste, aggregate and sediment/soils are prime candidates for recycling. The cost of chipping and grinding green waste is basically equal to that of incineration. However, there are significant differences in volume reduction. Incineration, for example, reduces the volume approximately 95%, leaving only an ash residue for disposal. Depending on the waste stream, chipping and grinding can typically reduce the volume on a 4-to-1 ratio (4 cubic yards is reduced to 1 cubic yard) or by 75%. For the October Snowstorm, the ratio AshBritt was able to achieve fluctuated between 5:1 and 6:1. The

ratio was achieved because of the nature of the woody debris – almost all tree limbs and branches which could easily be chipped, thereby achieving a greater reduction ratio.

For chipping and grinding to be feasible, the 25% of volume remaining in a 4:1 reduction ratio, must have some benefit or use. The ability to use the recycled wood chips as mulch for agricultural or erosion control purposes, or in the landscape industry and even for a fuel for industrial heating or in a cogeneration plant will negate the need to incinerate clean wood, provided separation of clean versus treated wood has been accomplished. Clean wood, namely green waste, should be managed within each municipality and can be done without creating significant environmental hazards. However, for massive amounts of green waste, it may be necessary to transport it out of the municipality to a regional DMS. This was not the case for the October Snowstorm or Tropical Storm Irene, but a larger storm event (i.e., a Category 3 Hurricane) would no doubt require larger, more expansive sites that could accommodate both state and municipal debris.

Asbestos contaminated material (ACM) must be collected, properly contained, and disposed of as quickly as possible and other hazardous wastes must be handled separately from other debris in order to ensure public and worker safety and in order to prevent portions of the waste stream which can be recycled or disposed as solid waste from being contaminated with hazardous wastes.

***Management Recommendations for Major Types of Debris:*** For the purposes of this Plan, debris categories are named for the most likely items requiring management after a disaster event and shall be managed as follows:

### **1. Green Waste/Vegetative Debris**

*For the purposes of this Plan, green waste is that portion of the clean wood waste stream consisting of vegetative debris including all portions of a damaged or downed tree to include the stump, limbs and other brush.*

The management of green waste/vegetative waste on State and municipal property and right-of-ways will be both a State and municipal responsibility. The management of trees damaged during a natural disaster event is based on a number of factors and includes determining whether a tree is hazardous or non-hazardous based on the following:

- Dangerous hanging limbs having a diameter of 2" or greater above the right-of-way;
- Fallen and leaning trees within the ROW, including trees extending onto the right-of-way from private property; and
- Dangerous and exposed stumps.

Green waste will be separated from other debris, cut to manageable size, and transported to State DMS or municipal debris staging sites in the towns where generated. In a worst-case scenario, regional wood waste sites will be designated. The brush should be chipped while the wood is still green and the limbs and trunks processed into firewood or wood chips. Many municipalities have chippers and some have tub grinders; there are also commercial services available. The resultant processed wood material can be provided to residents or sold to commercial landscapers. It can also be used as a carbon source in composting animal carcasses and municipal solid waste during a debris management crisis. If the amount of stored wood exceeds the needs of the municipalities and landscape industry, then the wood may be sent to a final destination site, either municipally owned or in private ownership. If the final destination site is not permitted, state agencies and municipalities may contact DEEP to request an Emergency Authorization for the storage of processed wood, typically first grind wood chips. The scope of authorization will be 1) to store and manage wood chips resulting from processing of green waste generated by the storm event and 2) Designate a location for the management of wood chips resulting from the processing of green waste generated by the storm event. While incineration is an option, it does

not follow the preferred SWMP hierarchy. All green waste generated in a county under the Emerald Ash Borer ban must be managed accordingly.

## **2. Putrescent Municipal Solid Waste (MSW)**

*For the purposes of this Plan, the putrescent portion of the MSW is considered as primarily food spoilage and contaminated or damaged recyclables such as wet or mildewed newspaper, cardboard, etc. which requires immediate disposal.*

The preferred management approach for MSW is for this waste to be processed at a resources recovery facility (RRF). There is the expectation that normal operations will resume for weekly garbage collection. If at all possible, this waste should be containerized at the curb for collection to be brought to one of the in-state MSW RRFs. However, the amount of MSW requiring disposal may increase significantly in times of an emergency as businesses, residents, and institutions are forced to dispose of damaged consumer goods. Therefore, some portion of one or more DMS may have to be dedicated to the collection and storage of putrescent MSW. DEEP will coordinate with the DPH and DESPP/DEMHS on a notification procedure to the public regarding food spoilage and special emergency procedures for the collection and/or drop off for this waste type. To the extent that there are facilities available for the processing of food waste, efforts will be made to direct appropriate materials to these facilities. If the State's MSW RRFs' burn capacity proves to be insufficient because of the amount of disaster-related MSW, or if one or more of the facilities cannot operate due to storm damage, MSW will have to be disposed of at in-state landfills or transported to out-of-state facilities. The in-state Resources Recovery Authorities, in consultation with the owners and operators of the active in-state landfills, will be required to organize the allocation of MSW among the facilities and make arrangements, as necessary, for the transport of excess MSW out-of-state.

## **3. Construction and Demolition Debris (C&D)**

*For the purposes of this Plan, C&D consists of debris resulting from structural damage to buildings as well as buildings that will require demolition as a result of the disaster event, and will include items such as aggregate (concrete, brick, block), wood (both clean and treated), roofing and siding materials, wallboard, metals, carpeting and flooring, insulation, glass, tile, window coverings, plastic pipe, heating and ventilating, and air conditioning systems and their components, light fixtures, furnishings and fixtures.*

Debris from structural damage to buildings, bridges, roads, etc. will constitute the State's largest debris management problem. Prior to moving such debris, municipal fire officials must consult Superfund Amendments and Reauthorization Act (SARA) Title III: The Emergency Planning and Community Right-to-Know Act (EPCRA) information to determine whether hazardous materials or waste is likely to be encountered. Such information is available through Local Emergency Planning Committees and the Regional Local Emergency Planning Committees. DEEP will assist with this task. They must also screen for large quantities of asbestos (siding, roofing, pipe wrap, etc.) and leaking oil tanks. For asbestos, USEPA's December 2009 publication entitled Guidance for Catastrophic Emergency Situations Involving Asbestos, EPA 340/1-92-010, serves as effective guidance in managing this material. The guidance has been updated since its previous 1992 publication and discusses specific events that occurred since that time contributing to the updated guidance.

Methods for handling these wastes are described below. Any scrap metal or clean rubble must be kept separate. The balance of the material will be loaded and trucked to a storage and processing site.

***Non-Asbestos containing waste:*** C&D that is free of asbestos will have to be reduced in volume and sent to a permitted in-state volume reduction facility that handles C&D. Most of the C&D that is processed at Connecticut volume reduction facilities for C&D is then sent to out-of-state landfills for disposal. It is

anticipated that in a catastrophic natural disaster, such as a Category 3 hurricane or higher, there will be far more C&D requiring disposal management than can be handled by the existing in-state volume reduction facilities and landfills. Hence, the need for DMS. The importance of pre-positioned contracts, previously arranged by the State, regional trash authorities, or the municipalities will ease the burden by providing for processing and transport from the DMS to the out-of-state landfills. Processing to reduce the volume of C&D should include, if possible, the removal of metals and aggregate such as brick, block, and concrete. DEEP has prepared an environmental program fact sheet on renovation and demolition activities that cover much of the same type of waste material that could result from a disaster incident. The fact sheet outlines environmental, health and safety requirements concerning: asbestos; lead-based paint; fugitive dust and air emissions; C&D waste; treated wood; land-clearing debris; chemical products; mercury; PCBs; used electronics and batteries; contaminated equipment/structures/soil; air conditioners and refrigeration equipment; underground storage tanks; site cleanup issues; spills; and drinking water supplies. For more information, access DEEP website at:

[http://www.ct.gov/dep/cwp/view.asp?a=2718&q=325410&depNav\\_GID=1646](http://www.ct.gov/dep/cwp/view.asp?a=2718&q=325410&depNav_GID=1646)

**Asbestos containing waste:** Suspect asbestos-containing materials (ACM) shall be either treated as ACM, or sampled and analyzed for asbestos content. The identification of ACM shall be made by an asbestos consultant licensed by the Department of Public Health (DPH), with certification as an Inspector or Management Planner, or by individuals identified by the DPH as appropriately qualified. Materials that are sampled for asbestos content must be analyzed at an environmental laboratory certified by the DPH. Whenever feasible, asbestos-containing debris shall be segregated from non-asbestos containing debris. In the event that the asbestos-containing debris cannot be segregated from other construction debris, all debris must be disposed of as asbestos-containing waste. Asbestos-containing debris must be adequately wetted during the process of collection and processing, and must remain adequately wet while packaged and placed in a waste container for disposal. Asbestos-containing waste shall be appropriately labeled and shall be disposed of at a waste disposal facility authorized for disposal by DEEP, or if disposed of out-of-state, at an authorized waste facility within that jurisdiction. Asbestos destined for a Connecticut disposal facility typically must first be authorized by DEEP through a special waste authorization letter. Asbestos abatement shall be conducted in accordance with applicable federal, state, and municipal requirements. These shall include, but not necessarily be limited to, the asbestos National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61, Subpart M), the DPH regulations (*Standards for Asbestos Abatement, Licensing and Training Requirements for Persons Engaged in Asbestos Abatement and Asbestos Consultation Services, and the Asbestos-Containing Materials in Schools regulations*), and Department of Labor regulations.

#### **4. White Goods**

*For the purposes of this Plan, white goods are a category of scrap metal and include appliances such as stoves, refrigerators, freezers, dishwashers, washers, dryers, microwaves, air conditioners, other similar types of appliances.*

White goods should be segregated curbside to the extent it is necessary to then stage white goods at an authorized DMS or permitted solid waste facility. White goods must be stored in an area separate from other solid waste, preferably on an impervious surface, and must be stored in a manner that prevents vector and odor problems. White goods shall be removed from a site within 90 days to the extent practicable. PCB capacitors and Freon may be contained in old appliances. Until white goods arrive at their final destination, they should be handled in a manner that will prevent a release of refrigerants. Freon shall be required to be removed from any white goods at a DMS or final recycling/disposal facility.

Scrap metal dealers will be required by Emergency Authorization to remove any capacitors and capture any Freon prior to processing the appliances. Typically, municipalities are responsible for removing the Freon and capacitors, but the emergency may prevent them from spending time to do this. FEMA project

record keeping requires written verification that Freon has been removed from each unit. In addition to the removal of PCBs and Freon from white goods, putrescent MSW will also have to be removed and disposed of properly.

#### **5. Household Hazardous Waste (HHW)**

*For the purposes of this Plan, HHW is considered to include, but not be limited to, items such as automobile fluids, batteries, paints and stains, cleansers, photo chemicals, lawn-care chemicals, and pesticides.*

Prior to a disaster, DEEP encourages residents to take advantage of local household hazardous collection programs to clear out hazardous products before a disaster strikes, thereby limiting the amount of hazardous products that will need to be managed once an incident occurs. If storm damage is such that HHW can be containerized by residents at the point of generation, instructions will be communicated to residents as to the best management practices for curbside containerizing of HHW or for containerizing and transporting to a temporary debris staging site. Curbside containerized HHW will then be transported to a pre-identified local or regional temporary aggregation site which might include a public works garage, transfer station or some other temporary location where the waste materials can be stored until an authorized HHW contractor can be brought in to deal with the material. Private contractors will be directed to separate any HHW that may be mixed with other waste at the curb and to take the HHW only to a pre-identified temporary HHW aggregation site. Some municipalities may have access to qualified contractors from conducting HHW cleanup days. There are four regional HHW facilities in the state. They are located in Essex, New Haven, Manchester, and Willington. All four facilities are permitted by DEEP, and are operated by Clean Harbors. During an emergency cleanup operation, the Commissioner, through an emergency authorization, may waive or adjust permit requirements like scheduling where calling ahead to drop off waste items is usually required. The municipality may also choose to have a trained person (40 hour HAZWOPER) supervise the receiving of waste items after normal operating hours, or the HHW contractor(s) may provide additional staff as necessary to operate the facilities beyond normal operating hours.

#### **6. Hazardous Waste**

*Hazardous waste will include materials like petroleum-contaminated media, chlorofluorocarbons (CFCs), and all other substances as defined in 40 CFR (Code of Federal Regulations) 261.3.*

Hazardous waste, once identified by private owners or State and local officials, must be segregated from other disaster-generated waste, stored separately, and ultimately disposed of at a permitted commercial hazardous waste disposal facility out-of-state. The Toxicity Characteristic Leaching Procedure ("TCLP") is generally required to determine if a waste is toxic (Section 22a-449(c)-101(a)(1) of the Regulations of Connecticut State Agencies, incorporating 40 CFR 261.24). However, generators may use knowledge of the material to manage as hazardous waste without conducting analyses. These materials must be handled by Connecticut licensed Hazardous Waste Transporters and licensed Spill Response Contractors. If hazardous or unknown materials such as lead, PCBs solvents, pesticides, herbicides, pool chemicals, industrial grade cleaning solutions, and other similar types of materials are discovered during a demolition or cleanup, the materials should be staged separately and with secondary containment to collect leaks and prevent further mixing with other hazardous waste or incompatible chemicals. If possible, the material should be segregated from the rest of the demolition and cleanup. During a debris management crisis, owners would be responsible for notifying DEEP's Emergency Response and Spill Prevention Division at 860-424-3338 of spill releases that pose a potential threat to safety, health, and the environment. For more information related to managing PCB containing disaster debris, see the USEPA document entitled "Planning for Polychlorinated Biphenyl (PCB) Containing Disaster Debris, June 2011 (<http://www.epa.gov/wastes/homeland/docs/pcb-disposal.pdf>). This document supplements the USEPA's

“Planning for National Disaster Debris Guidance” (Document ID Number EPA530-K-08-001) located at <http://www.regulations.gov/#!documentDetail:D=EPA-HQ-RCRA-2008-0329-0186>.

### **7. Aggregate (Fill Materials)**

*For the purposes of this Plan, aggregate is defined as clean, uncontaminated brick, block, concrete and asphalt.*

Clean, uncontaminated asphalt, brick and concrete can be reused. Concrete that has been contaminated by a petroleum product or chemical spill as a result of a natural disaster event should be prepared for disposal with other construction and demolition materials. Clean materials can be transported to aggregate recycling facilities within the State. Aggregate materials should be placed in a separate pile curbside for collection.

### **8. Scrap Metal**

*For the purposes of this Plan, scrap metal refers to ferrous metals such as structural steel and steel framing members and non-ferrous metals such as wiring/conduit, plumbing (pipes and fixtures) and HVAC materials (ductwork, motors). White goods are considered as scrap metal, but are described separately.*

Scrap metal, to the extent possible, should be segregated at the curb for collection and brought to a DMS or directly to a scrap metal processor located in the State. Handling scrap metal from stray and abandoned vehicles is covered under the section dealing with *Stray and Abandoned Vehicles and Vessel*.

### **9. Electronic Waste**

*For the purposes of this Plan, electronic waste (e-waste) includes items such as stereos, televisions, VCRs, DVD players and computers and peripheral accessories, telephones, and other devices.*

E-waste should be segregated to the extent possible at the curb. Most e-waste contains hazardous materials like lead and a host of other toxic substances that should be kept out of the landfills. DMS should allocate a discrete area for the collection and storage of e-waste. E-waste that is transported to a DMS shall be managed in accordance with Connecticut’s Universal Waste Rule as found in Section 22a-449 of the Regulations of Connecticut State Agencies. For more information on Universal Waste Rule, access DEEP’s website at: <http://www.ct.gov/dep/cwp/view.asp?a=2718&q32542#top>

### **10. Soil, Silt and Sediment (Uncontaminated; Contaminated)**

*For the purposes of the Plan, contaminated soil, silt and sediment can be defined as residuals deposited by receding flood waters which may include historical sediment from nearby water bodies, soil from yards, road and construction debris, and other material.*

*Uncontaminated:* This is material that has not been subjected to spills, floodwaters or has been determined by analytical testing to be not contaminated. This material could be transported to a staging area until final disposal or reuse has been determined.

*Contaminated:* The sediment left behind after receding flood waters and washouts often contains a wide variety of pollutants including fuel oils, gasoline, human and animal waste, metals, and other materials. As a result of certain conditions, some soils may exhibit visible or known traces of petroleum or chemical spills. These soils should be excavated and placed in weather-tight containers, such as a covered and lined roll-off or inter-modal container. If these containers must be stored temporarily, they should be placed on an impervious surface, such as a concrete or asphalt parking lot for no more than 90 days. This material could be transported to a staging area until final disposal and reuse has been determined. If necessary, analytical testing should be performed to determine if the material can be reused or must be

disposed. If it is evident that the spill is the result of an empty or leaking piece of equipment (e.g., electrical equipment or similar source) which has not been tested, some testing of the soil may be necessary to identify if PCBs are present. PCB containing materials must be sent to a Toxics Substance Control Act (TSCA) or hazardous waste landfill outside of Connecticut. There are no PCB disposal facilities in Connecticut. Testing must be by USEPA-approved method 8082. If material is contaminated by a piece of PCB equipment, the equipment must be addressed by containerizing the entire item, if small enough or by draining the remaining fluid into drums and disposing of both the fluid and empty machine carcass at TSCA disposal facilities out-of-state. Empty equipment that has contained fluid with less than 50 ppm, once drained, can be managed as scrap metal provided it contains no free flowing liquid.

Used sandbags should be considered contaminated and should be collected, transported, and disposed of as directed by the State.

## **11. Animal Mortalities**

*For the purposes of this Plan, animal mortalities are defined as a significant loss of livestock, pets, and/or natural wildlife.*

Catastrophic animal mortalities, if they occur, would more likely be seen along the shoreline and along major river flood zones. These could include fish hatcheries, livestock, and horses. Incidental occurrences of small companion pets, such as dogs, cats, rabbits, etc. may be buried on-site or containerized and disposed curbside as MSW. Historically, massive animal disposal from disease outbreaks or barn fires has taken place at landfills and resources recovery facilities. While both of those disposal options still exist for management of disaster-related animal mortalities, capacity is limited at both. Composting is a method that other states have adopted in their emergency plans for dealing with catastrophic farm animal mortalities, and could be employed in Connecticut. In 2006, DEEP provided input into the State's Draft Pandemic Response Plan. Department of Agriculture and DESPP/DEMHS with regard to the disposal of poultry, products and contaminated articles. In 2007, the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) released a guidance document entitled *Catastrophic Mortality, Large Animal Disposal, Pit Methods-State of Connecticut* ([http://www.ct.nrcs.usda.gov/Soil\\_Pages/trench\\_summary.html](http://www.ct.nrcs.usda.gov/Soil_Pages/trench_summary.html)). This guidance outlines a method of disposing of large volumes of dead animals by placing the carcasses in successive layers in an excavated pit. In the event of an unexpected disaster, the federal NRCS maintains a listing of suitability for Catastrophic Mortality, Large Animal Disposal by soil component. Decisions about the disposal of large amounts of animal carcasses must be made on site specific information, including whether the animals are infectious; the location, number and type of carcasses; and the site characteristics that may limit on-site management. In the event of a catastrophic event, State and federal health and agricultural agencies should be consulted regarding the appropriate disposal method. Decisions on the disposal will be made in conjunction with DEEP, DPH, and Connecticut's Department of Agriculture; further consultations may be made with the appropriate federal agencies.

## **12. Waste Tires**

*For the purposes of this Plan, waste tires are defined as all tires that have been separated from the vehicle to which they belonged.*

Tires that are collected curbside or collected from other properties as a result of cleanup efforts will be kept separate and stored and disposed of as a special waste. When stored at a DMS, they shall be kept dry and preferably containerized. To the extent possible, tires will be transported to: a tire recycling facility in Connecticut; the tire resources recovery facility in-state; or as a last resort, an out-of-state facility for recycling or disposal.

### **13. Utility Related Debris**

*For the purposes of this Plan, utility related debris is defined as power transformers, utility poles, cable, and other utility company material.*

The public utilities, such as electric utilities, are responsible to remove and dispose of all their respective utility related debris, in accordance with their normal protocol. Additionally, municipal utilities (Bozrah, Groton, Norwalk, Norwich, and Wallingford) are responsible for removal and disposal of all their respective utility related debris. Non-utility private entities, such as private companies like manufacturers or facilities such as schools, shopping centers, etc., are responsible for removal and disposal of all their respective utility related debris. There is an exception where a situation exists on private property that necessitates that the State or its designated agent needs to correct or alleviate, as expeditiously as possible, serious disaster or emergency-related conditions which present continued threats to the health or welfare of the residents of the State. In all cases, management of this type of waste must be managed in accordance with applicable federal, state and local regulations.

During Tropical Storm Irene in August of 2011, there were approximately 295 transformer releases with 5% of those involving PCBs greater than 55ppm, with another approximately 10% containing lower levels of PCBs. During Hurricane Sandy, there were approximately 469 transformer releases with 2.5% of those involving PCBs greater than 55ppm. The clean-up contractor for this specific waste stream was dispatched in real-time with staff manning the utility storm center. The utilities provided DEEP with updated spill information several times per day. All PCBs were manifested for disposal to a permitted facility outside of Connecticut as there are no PCB disposal facilities in the state.

### **14. Stray and Abandoned Vehicles and Vessels**

*For the purposes of this Plan, abandoned vehicles are defined as cars, trucks, motorcycles, or recreational vehicles. The definition of abandoned vessel as expressed in CGS Section 15-140c is a vessel left unattended for more than 24 hours on the waters of the state not moored, anchored, or made fast to the shore; or a vessel left on the property of another for more than 24 hours without the consent of the property owner. For abandoned vehicles and boat recovery in waterways, the following document will also serve as guidance: FEMA Recovery Policy RP9523.5, Debris Removal from Waterways; issued October 30, 2012.*

Stray and abandoned vehicles (trucks, cars, and motorcycles) and vessels can impede response efforts by blocking access to roadways and waterways and can impact private property. In the event of a disaster emergency or civil preparedness emergency, CGS Sections 28-9c and 28-11 would authorize the taking of property and provide a means for the owner to obtain just compensation, consistent with basic constitutional requirements. In order for removal of vehicles and vessels to be eligible under FEMA reimbursements, the applicant must demonstrate the following:

- The vehicle or vessel is presenting a hazard or immediate threat (i.e., blocking ingress/egress, located in a public use area);
- The vehicle or vessel is abandoned (i.e., vehicle or vessel is not on the owner's property and the ownership is undetermined);
- Applicant must follow the local ordinances and state law by: securing ownership, verifying chain of custody, transport, and disposal of the vehicle or vessel; and
- All supporting documentation relating to removal of abandoned vehicles or vessels must be submitted to FEMA for reimbursement.

For the recovery and removal of stray and abandoned vehicles and vessels, the work will most likely be performed by the State's debris management and monitoring contractors. The contractors will be responsible for providing vessels, experienced personnel, standard equipment and accessories, fuel, and use of the most cost-effective technology for this type of work.

The State's Contractors will work with the State to secure sites where vehicles and vessels can be stored until demobilization. Sites should be level, clean, dry and have a firm surface and be accessible by recovery and remediation vehicles and equipment. Each site will require an evaluation and be prepared with regard to issues of ingress and egress, highway access, neighborhood concerns and soil conditions. The Contractor will be responsible for mobilization, build-out of site, operations at the site, and demobilization.

*Stray and Abandoned Vehicles:* The removal and recovery of stray and abandoned vehicles within the public right-of-way needs to be a cooperative effort between, local governments, and the State debris removal contractor. Those state and local officials that will be critical to the operations are the State Department of Motor Vehicles (DMV) and state and local law enforcement officials. The basic procedure will be to use licensed tow trucks/wreckers to transport collected vehicles to an authorized secured aggregation site. Once at the aggregation site, these vehicles will be inventoried for such information such as vehicle make, model, VIN number, plate number, extent and type of damage, and other related information. Vehicles will be stored in a manner to permit inspection by State authorities as required, or for reclamation by owners. Vehicles shall be discharged to appropriate entities for disposal, recycling, or other appropriation as determined by the State, after clearance through applicable State and/or local protocols and after documentation. Protocols for the removal of vehicles that may end up on private properties will need to be established by the State.

In addition to any information which the DMV may require, the State's contractor will be required to provide the following additional information:

- The date and time the vehicle was towed;
- The location from which the vehicle was towed;
- Documentary proof of the results of the National Crime Information Center check for every vehicle in its possession;
- Complete documentation of any sale or disposition of each vehicle, including documentation of all efforts to determine the identity and address of the owner and lien holder (if any), as well as copies of all notices sent to the owners and any lien holder; and
- If the vehicle was claimed by the owner, lien holder, or authorized agent, the date, time, and name of the person the vehicle was released to, as well as a complete listing of all charges and fees assessed.

The State's contractor will need to collect all applicable fees, including the cost of recovery, transport and storage prior to releasing the vehicle to the owner, lien holder, or authorized agent and net the amounts from the bill to the State.

*Stray and Abandoned Vessels:* Unless such authority is suspended or superseded by the Governor during an emergency or preempted by federal law, it is important to defer to the authority established in state law regarding the removal and processing of displaced or abandoned vessels. The authority will vary depending on where and how the displaced vessel has come to rest. Under current law, DEEP's Boating Division administers the abandoned boat law (CGS Section 15-140c) in cooperation with the DMV; the ConnDOT administers Harbormaster law (CGS Section 15-1 et seq.). Both will be important in a mass displacement event.

For those vessels, floating or not, that are moored to tackle that have been displaced and come to rest within the waters of the state, the harbormaster (where extant) with jurisdiction over the area where the vessel has come to rest has authority. The law provides a harbormaster with the authority to station and re-station vessels, to declare vessels derelict, and with associated cost recovery tools that are not available

elsewhere (CGS Section 15-1 et seq.). A harbormaster may also secure a free floating or grounded and unattended vessel and bring it under his or her authority. Harbormasters are agents of ConnDOT.

For those vessels that are found free floating and that are unattended for more than 24 hours, and for those that have come to rest on a property without the consent of the property owner (having been at rest for more than 24 hours), the person who collects the vessel from the water, or the person on whose property the vessel comes to rest, has the authority to initiate the abandoned boat process under CGS Section 15-140c. It should be noted that vessel ownership information is kept in qualified confidentiality by the DMV, and that certain procedures are in place that allow an aggrieved landowner to obtain vessel ownership information. It is also important to note that the DMV and DEEP have developed an abandoned boat process that, if followed, provides for notification of the last owner of record and, if unsuccessful in causing the removal of the vessel by the owner, allows the aggrieved landowner to gain control of the vessel after the completion of a sixty-day process. Unless preempted by superseding emergency-related law, this is the procedure under which most abandoned vessels will be processed.

*Maritime Law and Salvage Operations:* It is likely that in the aftermath of a mass displacement event salvagers may attempt to recover sunken vessels and/or vessel in peril as a business venture. This is an ancient practice with a long international body of law supporting it, and it is important to allow it to proceed if someone has undertaken a salvage operation (unless avoidable environmental harm is being caused). Note, in order for an operation to be considered salvage, a vessel must be in peril and the owner must be unreachable or must give acquiescence. A salvager may remove the vessel from peril (un-ground it, re-float it, etc.) and may make a claim against the owner of the vessel for a substantial percentage of the value of the vessel and any cargo. That having been said, private owners may independently hire salvagers to recover their vessels. While not technically a "salvage" operation, there is no reason to interfere with such operations unless they are causing harm to the environment.

*Agency Cooperation:* The removal and recovery of displaced and abandoned vessels within the public right-of-way may need to be a cooperative effort among State and local governments as well as the State's debris removal contractor. Additionally, coordination with federal agencies, such as the USCG, FEMA, and USACE may also be necessary. As stated above, removal of vessels meeting the conditions identified below may be eligible for FEMA reimbursements:

- The vessel is presenting a hazard or immediate threat (i.e., blocking ingress/egress, located in a public use area); and,
- The vessel is abandoned (i.e., vehicle or vessel is not on the owner's property and the ownership is undetermined).

In order to be eligible for reimbursement, the applicant must be able to demonstrate the following:

- The applicant must follow the local ordinances and state law by: securing ownership, verifying chain of custody, transport, and disposition of the vessel; and
- All supporting documentation relating to removal of vessels must be submitted to FEMA for reimbursement.

Recovery of vessels will begin with the State's debris removal contractor identifying the vessel using GPS coordinates. The debris removal contractor will first inspect the vessel and make a record of the vessel location, description, registration number, hull identification number, size and the type and extent of damage. Prior to loading, the State's contractor will mitigate for any fluid leaks before transporting the vessel to the aggregation site. Vessels will then be processed at the aggregation site. During storage, vessels will be checked for leaks of fuels or other hazardous liquids. If leaks are found, they will be mitigated by the contractor to include the removal of bilge fluids and damaged batteries. For safety purposes, battery cables will be disconnected from undamaged batteries.

*Displaced Vessel Aggregation:* The basic procedure will be to recover and tow displaced and abandoned vessels to an authorized secured aggregation site, whether this aggregation site is on water or on land. The condition of the vessel should be documented as soon it is safe to do so. Once at the aggregation site, the vessels will be inventoried using their existing registration number, or if not present, hull identification number. If neither number is present, a unique tracking number should be assigned. Such numbers will be used to monitor the vessel through each step.

The State debris removal contractor will secure the aggregation site and provide access to owners, lien holders, and their authorized agents or legal representatives at set times for the purpose of identifying and/or representing vessels in which they have a legal interest.

It is important that vessels aggregated on the water be left on the water if possible, and at a location under the authority of a cooperative harbormaster. This will allow the harbormaster to invoke existing law with respect to vessel stationing and full cost recovery, as well as vessel disposal for derelict vessels. Boat owners will be asked to assume vessel removal costs regardless of the condition of the boat, but current law makes this difficult to enforce except in the case where a vessel can be removed under harbormaster law.

## **15. Disaster Debris in the Marine Environment – Waterway Debris**

In a catastrophic storm event, the categories of debris previously described are not only dispersed on land, but also in streams, rivers, coastal marshes and wetlands, and offshore areas of Long Island Sound, either originating from Connecticut or Long Island. Waterway debris can be invisible, making it difficult to locate, avoid, and remove. It can damage fishing boats and fishing gear, cripple fishing operations and prevent commercial and recreational activities in affected areas.

Removal of waterway debris in shipping channels is usually addressed by the USACE in order to open these vital transportation and commercial routes quickly. However, there currently exists no established mechanism to plan for, survey, and remove waterway debris in areas outside of major shipping and navigation channels in affected waterways of Connecticut, and no existing guidelines to facilitate such a process. At some point, much of the debris is likely to wash up on shore and once deposited above the mean high water line becomes the property owner's responsibility. Even while below the mean high water line, the littoral property owner may have some responsibility (see CGS Section 22a-363e below), though this is not likely to be a very popular option.

**CGS Sec. 22a-363e. Failure to comply with order. Littoral owner as responsible party.** When, notwithstanding any request for a hearing or a pending appeal, any person fails to comply, within a reasonable time as established by order of the commissioner, with any requirement to discontinue, remove or otherwise abate or alleviate any condition found by the commissioner to constitute an imminent and substantial hazard to public safety or navigation or likely to cause imminent and substantial damage to the environment, the commissioner shall have authority to remove, abate or alleviate any such condition. The commissioner may assess reasonable costs and expenses incurred in such removal, abatement or alleviation against the person responsible. The Attorney General shall, at the request of the commissioner, institute proceedings to collect any such assessment. For the purposes of this section, in the event that the person responsible for causing, retaining or maintaining such condition cannot be determined, the littoral owner shall be deemed to be the responsible person except in the case of vessels abandoned on the property of such owner. Nothing in this section shall be construed to preclude the commissioner from exercising any other enforcement authority.

Acknowledging the experience that New Jersey undertook as a result of Hurricane Sandy, the State's contractors may be activated to accommodate large scale removal operations of waterway debris. The State's contractor, as directed, will identify submerged debris in waterways, removing debris from State-owned waterways, disposing or recycling of debris, and dredging and redistributing sand as necessary. The State and its contractors will ensure that all work performed is eligible for FEMA Public Assistance grant funding and is performed in accordance with FEMA regulations, policies, and guidance.

Based on field observations and aerial reconnaissance, the impacted coastal and river waterways will be divided into zones for waterway debris removal and they will be ranked for complexity of debris removal operations, anticipated volume of debris, and other factors. This task will be done by the Contractor with the assistance of the DEEP Office of Long Island Sound, Coastal Planning Division and the USACE. As in the case of Hurricane Sandy, zones will extend inland to the farthest extent of a storm-related tidal surge as defined by FEMA.

The State's contractor will take the lead in submitting to the IDMTF a detailed debris removal and management "Zone Work Plan" (ZWP) for each zone impacted by the storm. Each work zone can further be divided into smaller more manageable work zones or sub-zones. The ZWP will include a defined Concept of Operations and Work Strategy, work flow, Organizational/Management Structure, zone Safety Plan, off load points, dock facilities and any other project specific items as identified by the IDMTF. Each ZWP will be submitted for approval prior to beginning any work.

The State contract's specifications will detail the operation for waterway debris removal. In general, the following are some of the contract specifications:

- The contractor will be responsible for performing a pre-removal assessment, using the most cost-effective technology, to document waterway debris prior to commencing debris removal. The Contractor must present a plan to the IDMTF for approval indicating the areas in which it seeks to perform a pre-removal assessment. The plan must include specific areas to be scanned and supporting reasons for a scan of that area including, but not limited to, an explanation of tidal forces moving debris to particular areas.
- Debris removed from the waterway sorted prior to or at the time it is removed from the Contractor's boats/barges and placed on shore for final disposal.
- Dredging of sand will not begin until all eligible debris overlying the sand is removed.
- Freon will be removed for recycling from white goods prior to hauling to an approved landfill.
- Care will be taken by the contractor to minimize impacts to coastal marshes and wetlands and aquatic vegetation as well as destruction to shellfish beds when conducting waterway debris removal operations. The Contractor will be required to have a Connecticut approved plan for avoiding or minimizing physical injury to natural resources while removing debris, avoiding or minimizing releases of hazardous substances or oil while removing debris; characterizing and responding to releases of hazardous substances or oil occurring during debris removal; remediating the release of a hazardous substance or oil, if it occurs; characterizing injuries to natural resources and public use of those resources in the event of a hazardous substance or oil release; identifying potential projects/measures to restore or compensate the public for demonstrated natural resource injuries; and rehabilitate oiled or injured wildlife.
- Before reporting that all work has been completed in a zone, the Contractor will utilize side-scan sonar, LIDAR or other cost-effective and appropriate technology to

ascertain that all eligible debris has been removed from the waterway and provide written verification of such.

#### **4.5 Managing for the Potential of Human Remains**

If suspected human remains (defined as dead bodies, tissue and/or teeth and bones) are found during the debris removal process, the State's debris removal contractor will immediately stop all operations in the area where the remains were found and take measures to secure the area from further disturbance. The State's debris management contractor's project manager will notify the state and local law enforcement officials, as well as the IDMTF of the situation. Strong coordination efforts are needed in response to this sensitive issue. The law enforcement officials, with support of the State's medical examiner, if necessary, will properly document the situation and collect the remains and other items deemed appropriate. Operations may resume once the law enforcement officials notify the Interagency Debris Management Task Force that the site has been released.

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## CHAPTER 5

### PLANNING and OPERATIONS: Debris Management Sites and Concept of Operations Plan

#### 5.1 Overview of Chapter

All activities associated with massive debris clearance, removal, and disposal activities depend upon the availability of suitable sites for managing debris. In major disasters, there may be insufficient landfills to handle the debris in a timely fashion. State agencies and communities may use temporary DMS to store, segregate, or reduce the volume of debris. To appropriately plan for and incorporate social, economic, and environmental considerations, it is important that DMS planning be conducted prior to a disaster event. Further, the effective execution of the *Disaster Debris Management Plan* relies on careful timing and a progression of various tasks and decisions. This is particularly important with regard to the sequence of operations to be followed under the two phases of cleanup.

This Chapter discusses the planning components to be considered with regard to establishing DMS and also discusses the State's Concept of Operations Plan.

#### 5.2 Debris Management Sites<sup>1</sup>

##### 5.2.1 Overview

The importance of having potentially suitable DMS pre-identified and ready for use at all times in the event of a disaster event cannot be stressed enough. The advanced identification and securing/acquisition of DMS is the responsibility of the State and local governments. Debris management guidance from the USACE and FEMA strongly recommends that both State and local governments be responsible for pre-identifying DMS, preferably on public property, though private property should not be ruled out, especially when public property is not available or not as suitable or accommodating. Pre-identification of suitable DMS will allow post-disaster cleanup efforts to begin early and in an efficient manner.

DMS must be approved by DEEP to protect public health and the environment, as well as to ensure that the owner/operator of the DMS be qualified to receive Public Assistance funds from FEMA.

DEEP has pre-identified suitable DMS that may be activated for use through an Emergency Authorization. In developing this Plan, the projections made with regard to the amount of debris resulting from a Category 3 hurricane indicated a range of approximately 18 million tons to 20 million tons (approximately 43 million cubic yards) from a wet hurricane event. To put this amount into context, the State typically processes and manages approximately 5 million tons of solid waste (municipal solid waste; C&D) per year.

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<sup>1</sup> Excerpted from the following three documents: FEMA "Public Assistance Debris Management Guide, Publication #325, April 1999, Chapter 2 – Pre-Disaster Planning; [www.fema.gov/pdf/government/grant\\_pa/demagde.pdf](http://www.fema.gov/pdf/government/grant_pa/demagde.pdf); Participant Manual, Debris Management Course, FEMA, National Emergency Training Center, Unit 8 – Selecting and Operating Temporary Storage Sites; Florida DEP Guidance for Establishment, Operation and Closure of Staging Areas for Hurricane-generated Debris, Nov. 19, 2004 (updated Sept. 22, 2005)

DEEP undertook a planning exercise for the purpose of identifying potentially suitable locations for DMS. DEEP reviewed state-owned lands based on a number of environmental criteria, used its GIS capabilities, and conducted site analyses. Most state properties that were investigated were deemed not suitable for debris management. Others were deemed potentially suitable for designation as DMS, but would need prep work before being put into use. Based on the most recent storm events, private properties that were used as DMS remain on the list of future potential sites. The search for additional properties will be ongoing, and will be both public and private sites, depending on opportunities presented.

### **5.2.2 Environmental Considerations**

After a major natural disaster occurs, the emphasis is on rapid debris clearance from the public right-of-ways. The result is that DMS receive debris faster than can be reduced and ultimately disposed of. Consequently, these areas must be properly sited because of the potential of adversely impacting the land, water, and air of the State. These negative impacts could include: surface and ground water contamination, soil contamination, impacts to vegetation, odor, and dust. Therefore, the siting of DMS using the recommended criteria described in the following sections can greatly minimize potential impacts to the environment.

### **5.2.3 Site Selection Guidelines for Debris Management Sites**

DMS are temporary locations that can be used for the duration under a DEEP Emergency Authorization. Consistent with FEMA guidance, State policy and programs, and experience with Tropical Storm Irene and the October Snowstorm, DEEP has assembled the following guidelines for the selection of DMS:

- Pre-designated sites should preferably be on public property and generally consist of an area that, based on the State contractor's opinion, will serve the stockpiling of a particular waste stream, i.e. white goods may need a smaller area, then say, green waste. Therefore, smaller sites may be appropriate based on the type of waste being managed and space constraints. Use public lands first to avoid costly leases. Use private land only if public sites are unavailable or if a particular parcel proves to be user-ready and ideal for debris staging needs. If private lands are utilized for municipal debris management operations, they must have government (or its designated contractor) oversight and management.
- The required size of the site will depend on the expected type and volume of debris to be collected and planned volume reduction methods. As a general rule, larger sites mean fewer sites and, hence, easier site closeout. However, larger sites may create logistical problems.
- Large open sites are needed for any type of debris staging activity. Paved sites are best. Semi-paved or large parking lots paved in stone dust or gravel is the next best option. Meadows are least desirable because they may be inaccessible because of saturated soils after extended and heavy precipitation.
- If possible, per FEMA guidance, the soil, groundwater and/or surface water at and near a proposed staging area should be tested prior to receipt of disaster generated debris to establish pre-existing baseline conditions. For storm events, where green waste is the pre-dominate waste stream, it may only be necessary to document pre-existing conditions with either video and/or photographs.
- DMS for debris other than green waste should not be allowed in public source water protection areas including aquifer protection areas, public drinking water supply watersheds, and public well source areas.
- In no case should any DMS be located in or within 100 feet of a wetland area or watercourse.
- DMS for debris other than green waste shall not be located within 200 feet of a watercourse, waterbody, or wetland, unless otherwise approved by DEEP.

- Impacts from noise, dust, and traffic that are tolerated by the public early in a disaster recovery may have to be curtailed later. Avoid locating the DMS near residential areas, schools, and hospitals.
- Sites should not have critical habitat or rare ecosystems, threatened and/or endangered species, historic and/or archaeological sites.
- Sites should have good ingress/egress, preferably with an existing curb cut, to accommodate heavy truck traffic and have a site configuration that will allow for an efficient layout.

#### **5.2.4 Site Operation of a Debris Management Site**

DEEP has assembled the following guidance for operating a DMS based on FEMA guidance. DMS should have:

- Visible, demarcated buffer areas at the 200-foot or 100-foot wetland setback line.
- Storm water controls, such as silt fences, to prevent discharge of contaminated runoff into water bodies where such discharge may cause violations of State regulations.
- Some method to control the off-site migration of dust, wood chips, or other debris residuals from vehicular traffic and from the handling of debris and ash.
- An adequate supply of water to ensure that the debris is adequately wet during the segregation, processing and/or packaging of the waste to prevent risk of fire and/or dust migration.
- Some type of access control to prevent unauthorized dumping and scavenging.
- Monitors to correctly identify and segregate waste types, especially hazardous waste from non-hazardous waste, for appropriate management.
- Oversight management for the site.
- Secondary containment for portable fuel tanks, drums, and other fluids for operating equipment and vehicles.
- When staging debris other than green waste, if possible:
  - install wells and perform groundwater sampling;
  - conduct spot soil sampling at "hot" areas such as household hazardous waste (HHW), ash, other waste types;
  - provide specific fuel storage areas;
  - take videos, photos of the site before operations begin;
  - periodically sketch/map layout including "hot" areas; and
  - prepare quality assurance reports, spill reports, etc. as part of the overall project.

#### **5.2.5 Site Remediation/Closure Checklist for Temporary Debris Storage and Reduction Sites**

The testing and closure of DMS will be undertaken in accordance with all requirements of Connecticut statutes and regulations and federal laws. The following broad guidelines apply to the closure of DMS:

- Owner/operators of the DMS will be responsible for closure of the site in accordance with DEEP requirements, including environmental sampling, if needed.
- All disaster related debris must be removed by the expiration of the Emergency Authorization and/or General Permit, unless otherwise authorized by DEEP.
- Mulch and wood chips produced from processing uncontaminated green waste may be left on-site if prior approval is obtained from DEEP. DEEP will consider these requests on a case-by-case basis.

Areas that were only used to stage uncontaminated green waste, or ash from authorized burning of solely vegetative debris, will not require any environmental sampling after the debris or ash is removed unless

#### **5.2.6.3 Groundwater Testing**

- Groundwater should be tested on selected sites to determine the probable effects of rainfall leaching through either the stockpile areas or ash areas if burning is conducted. Although every effort must be made to avoid siting DMS in areas important for public water supply (section 5.2.3), it is possible that DMS could of necessity be sited in areas where the groundwater used for drinking water, whether through public or private drinking water supply wells.
- Runoff from stockpiled debris within the storage areas has the potential to contaminate groundwater. Although the probability of contamination is considered low, testing is needed because of the importance of protecting water quality and assessing consistency with Connecticut's Water Quality Standards, particularly in an area served by private drinking water supply wells.
- Groundwater monitoring wells or temporary sampling points should be placed around the perimeter of the stockpiles (especially for stockpiles of things like white goods, electronics, HHW, etc) that have remained for an extended period of time prior to final disposal, and burn piles, to determine if there is any type of contamination.
- Testing should occur at selected sites after all debris is removed. Results of such testing will be compared to the criteria defined in the Remediation Standard Regulations, Sections 22a-133k-1 through 22a-133k-3 of the RCSA for the applicable groundwater classification, as defined in the Connecticut's Quality Standards (authorized by the CGS Section 22a-426) and associated water quality classification maps.
- If applicable, results should also be compared to Drinking Water Action Levels as identified by the Drinking Water Section of the DPH.

#### **5.2.6.4 Generic Checklist for Quality Assurance at Closeout**

DEEP presents a generic checklist for Quality Assurance (QA) that should be considered at the close-out of each DMS. The Responsible Party for the site is responsible for closure in accordance with all applicable federal, State and local requirements. The generic checklist includes, but is not limited to, the following:

- Lease special conditions met?
- Debris stockpiles removed and disposed?
- Ash pile tested, removed, disposed?
- *Illegally filled or disturbed wetlands* restored and locations noted on appropriate State and municipal maps?
- Chain of custody records complete for the site?
- Location of storage area stockpiles marked on plans?
- Contractor petroleum and HHW spills remediated?
- Perimeter berms leveled and topsoil restored?
- Existing groundwater monitoring wells identified on map, secured and restored?
- Environmental records submitted (contractor groundwater and air quality monitoring if any, chain of custody records for HHW, other state approvals)?
- Site secured wherever stockpiles (chips, tires, etc.) do remain, to discourage illegal dumping?
- All contractor equipment and temporary structures removed?
- Compare baseline data of the temporary site to conditions after the stockpile is removed and the contractor vacates the site.
- Use Global Positioning system (GPS) coordinates to locate the sites for future reference needs.

### **5.2.7 Completing Closeout**

DEEP should be informed in writing when all closure activities at the DMS area are completed. If environmental sampling was conducted as part of the closure activities, then the closure notice should include the results of this sampling, unless otherwise approved by DEEP.

## **5.3 State of Connecticut's Concept of Operations Plan (ConOps) for Disaster Debris Management, Activation and Use of the State Debris Removal and Monitoring Contracts**

### **5.3.1 Overview:**

The *State's Natural Disaster Plan*, the State's Disaster Debris Management Plan, and the State's contracts for Debris Management and Removal Services and for Debris Monitoring and Documentation of Debris Removal Operations Services provide an organizational structure and general principles for managing catastrophic disaster debris management operations at the State and local levels.

The State of Connecticut developed the Concept of Operations Plan (ConOps) for Disaster Debris Management, Activation and Use of the State Debris Removal and Monitoring Contracts. The ConOps describes the phases of clean-up and the priorities associated with the clean-up. In addition, the ConOps details the steps that will be taken by the State, its contractors, and other parties so as to facilitate the removal, management, collection and disposal of all debris generated from a catastrophic natural hazard event such as a Category 3 hurricane. This ConOps is tied to the activation and use of the State contracts for disaster debris removal and monitoring. This ConOps is the Playbook by which the IDMF operates.

The scope of the ConOps is to:

- Provide overall coordination for state-wide disaster debris management implementation.
- Provide for the allocation of human, technical and financial resources available for disaster debris management.
- Provide for the coordination of disaster debris management on a state and local level, including push and shove, removal, collection, sorting, recycling, and disposal operations and the safety of personnel and the environment.
- Provides a pre/post event timeline and related activity and/or plan execution action items. It should be noted that this ConOps could also cover other types of natural disasters (i.e., ice storms, tornados, etc.) and that time frames would be modified to reflect the specific event.

### **5.3.2 Activities Timeline**

The ConOps activities timeline is segmented into four major operational time periods:

#### **5.3.2.1 Pre-Landfall Phases: -4 to 0 days (day 0 is landfall)**

Notice Event Activation of IDMTF and State Debris removal and monitoring contractors

- Identify potential threats and impacts
- Assess available resources
- Discuss potential resource sharing, including personnel and assets; prepare draft task orders
- Identify pre-placed contracts and confirm availability for stand-by or activation
- Coordinate deployment of personnel and pre-positioning of equipment, as appropriate

#### **5.3.2.2 Phase 1 – Initial Response/Debris Clearance: 0 to +6 days**

Phase 1 is the initial response and consists primarily of clearing from the public roads and right-of-ways the disaster debris that hinders immediate life-saving actions and that poses an

State of Connecticut  
 Disaster Debris Management Plan, revised June 2013  
 Annex to the State Natural Disaster Plan, 2009

immediate threat to public health and safety. The Phase 1 period is normally 70 working hours (i.e., one week) following an event (per FEMA guidance); however, it can be extended if the situation warrants it (through coordination with FEMA). Typically, the State clears State roads and municipalities clear local roads. Priority road systems in Connecticut are the federal interstates, the parallel roads along the federal interstates, and the State Routes. Roadway debris will be moved to the side of the road to provide access into damaged areas. Normally, no attempt is made to remove, segregate or dispose of the debris in this first phase. However, in rare instances it may be beneficial to remove the debris immediately when a significant health and safety risk is present. The initial emergency road clearance will be done based on the following priorities and on field assessments:

- 1) Support to Search and Rescue and other life-saving resources.
- 2) Critical life-sustaining facilities (i.e., hospitals, nursing homes, other).
- 3) Additional life-sustaining facilities (i.e., emergency feeding and sheltering sites, Local Distribution Points, other).
- 4) Critical community support facilities (i.e., police, fire, EMS, and emergency management sites, other).
- 5) Critical infrastructure facilities (i.e., Electrical Utilities, Telecommunications Utilities, other).
- 6) Longer- term sustaining facilities (i.e., water treatment facilities, wastewater treatment facilities, water pumping stations, other).

Priority road systems in Connecticut are the federal interstates (including the entrances/exits), the parallel roads along the federal interstates and the State routes. Table 5-1 shows the major routes that are found within the State's five Emergency Management Regions.

**Table 5-1. Connecticut's Emergency Management Regions/Assigned Debris Control Zones and the federal interstates and State roads located within each of the zones.**

Emergency Management Regions	Federal Interstates	State Roads
1	I-95	1, 7, 15, 53, 57, 58, 59, 106, 107, 127, 130, 135
2	I-91, I-95, I-691	1, 5, 17, 22, 34, 68, 69, 79, 81, 103, 110, 114, 121, 122, 139, 145, 146, 147, 149, 152, 154, 156, 337
3	I-91, I-84, I-384, I-291	2, 3, 6, 10, 19, 30, 44, 71, 71A, 75, 83, 94, 99, 140, 159, 167, 173, 177, 178, 179, 185, 186, 187, 194, 196, 217, 286, 314, 315, 316, 322, 364
4	I-95, I-395, I-84	1, 1A, 2, 2A, 6, 11, 12, 16, 21, 27, 31, 32, 44, 82, 87, 89, 97, 101, 117, 131, 138, 156, 163, 165, 169, 171, 184, 193, 195, 198, 203, 215, 244, 287, 289, 320, 354
5	I-84	4, 6, 7, 8, 20, 37, 39, 41, 43, 45, 47, 53, 55, 58, 61, 64, 67, 73, 102, 112, 116, 118, 128, 132, 172, 188, 199, 202, 222, 254, 262, 263, 272, 302, 341, 361

Per the *State's Natural Disaster Plan*, ConnDOT is responsible for clearing and/or removing wreckage and debris from state owned or maintained transportation facilities and also provides support of local debris management operations when conditions permit. Municipalities are responsible for their local roads. Immediate debris clearing actions on State and local roads and properties should be supervised by local public works or ConnDOT personnel using all available resources. In the event of a natural disaster and based on feedback from field personnel, a determination will be made by each impacted municipality if their in-house capabilities are sufficient to remove the quantity of debris generated by the event. If it is determined that the quantity exceeds the municipality's capabilities, municipalities should activate their contracts.

#### **5.3.2.3 Phase 2 – Recovery /Debris Removal: +7 to +29 days**

Phase 2 consists of removing, segregating, and disposing of the debris that hinders the orderly recovery of the community and poses less immediate threats to health and safety. Phase 2 could last up to a year or longer and may involve reassessment of debris quantities, operations of debris staging areas, public education, and debris separation, collection, storage, recycling and disposal activities. (*Normally the debris removal must be completed within 6 months, with a possible 6-month extension. This has frequently been extended when the situation warrants.*) Debris removal may begin during the emergency response phase and will constitute a major part of the recovery phase. Debris removal will be done based on the following priorities and on field assessments:

- 1) Public roads and bridges to ensure access for emergency and response vehicles to essential facilities, i.e., police, fire and emergency medical centers, hospitals, clinics, emergency operation centers, airports, municipal complexes, essential public utility facilities to include electrical transmission substations, water treatment plants, water supply facilities, sewage treatment plants, and generating stations. Public roads and bridges to ensure access for emergency and response vehicles to schools, libraries, community and educational facilities, and commercial establishments.
- 2) Public waterways essential to commerce and major flood drainage ways. (In this instance, ConnDOT, USACE, U.S. Department of Agriculture/Natural Resources Conservation Service (NRCS), and/or U. S. Coast Guard (USCG) may need to be involved depending on responsibilities.)
- 3) State properties.
- 4) Public recreational facilities.

#### **5.3.2.4 Post Recovery - Public Assistance, DMS Closure, and Quality Assurance: +30 to +180 days**

Monitor State and municipal recovery operations and progress, including closeout of temporary debris management sites, and develop after-action reports and revise plans, as appropriate.

### **5.3.3 Summary**

The ConOps Plan was first developed in 2009. Since that time, it has been activated and implemented for a number of federally declared storm events. In each of these cases, the ConOps Plan met the overall goal in achieving the desired outcome of the State's ability to efficiently and effectively manage the debris generated from a natural hazard event. However, this ConOps Plan is a dynamic document which is annually reviewed and revised as necessary by the Interagency Debris Management Task Force.

## CHAPTER 6 SUMMARY STATEMENT

### 6.1 Summary Statement

If a catastrophic storm event, such as a Category 3 hurricane were to strike Connecticut, it is estimated that approximately 18 million tons to 20 million tons of debris (40 million to 45 million cubic yards) would be generated as a result of that event. In Connecticut, approximately 5 million tons of solid waste is processed each year.

Connecticut is better positioned to effectively respond to such a storm event because of the documents in place – this Plan, the Concept of Operations Plan, and the pre-positioned contracts for both debris removal and management and debris monitoring and documentation. For recent catastrophic storm events, Connecticut was able to effectively deal with managing large volumes of woody debris and significantly lesser amounts of construction and demolition debris because of the Plan and the State contracts. However, the Plan and the State contracts have not yet been tested for the level of devastation recently suffered by parts of New York and New Jersey as a result of Hurricane Sandy which was a Category 1 hurricane.

Therefore, Connecticut must continue to plan, train, and be prepared to be able to respond to natural hazard events. The list below identifies areas that need to be considered for a stronger operational approach:

- The State DOES NOT have enough processing and/or final disposal capacity in-state to manage debris generated from a Category 3 hurricane. Processing capacity includes the existing solid waste infrastructure and debris management sites that are established as a result of a natural disaster. While there are opportunities to increase processing capacity at existing infrastructure sites, the volume of debris may be such that the existing infrastructure would be quickly overwhelmed, therefore necessitating the need for both DMS that would also serve as volume reduction plants to facilitate quick and more efficient transport of waste for out of state disposal. With the anticipated volume of construction and demolition debris, out of state disposal is the only option. Various modes of transport other than trucking must be considered such as rail, barge, and container freight.
- The number and location of DMS is critical in any planning. Currently, the state has identified a limited number of state owned sites for State use. However, these site do not have the capacity that would be needed to manage debris generated for a Category 3 hurricane. The State continues to research and evaluate state-owned lands for their potential to serve as a DMS. The State will have to look to privately owned property to accommodate the projected capacity needs. Similarly at the municipal level, municipalities must identify their own DMS locations whether on municipally-owned land or on leased private property. Additionally, it is the municipalities' responsibility to ensure that the DMS has obtained the necessary permit(s)/authorization(s). Finally, both the state and the municipalities should consider regional DMS.
- Challenges still exist in cleaning non-hazardous debris from shallow waters and marshes just offshore that the USACE or the Guard might not handle. The IDMTF is reviewing some of the research coming from the National Oceanic Atmospheric Administration, in particular, their study of similar challenges in the Gulf Coast. This is an issue of debris clean-up that still requires additional investigation.